

(No Model.)

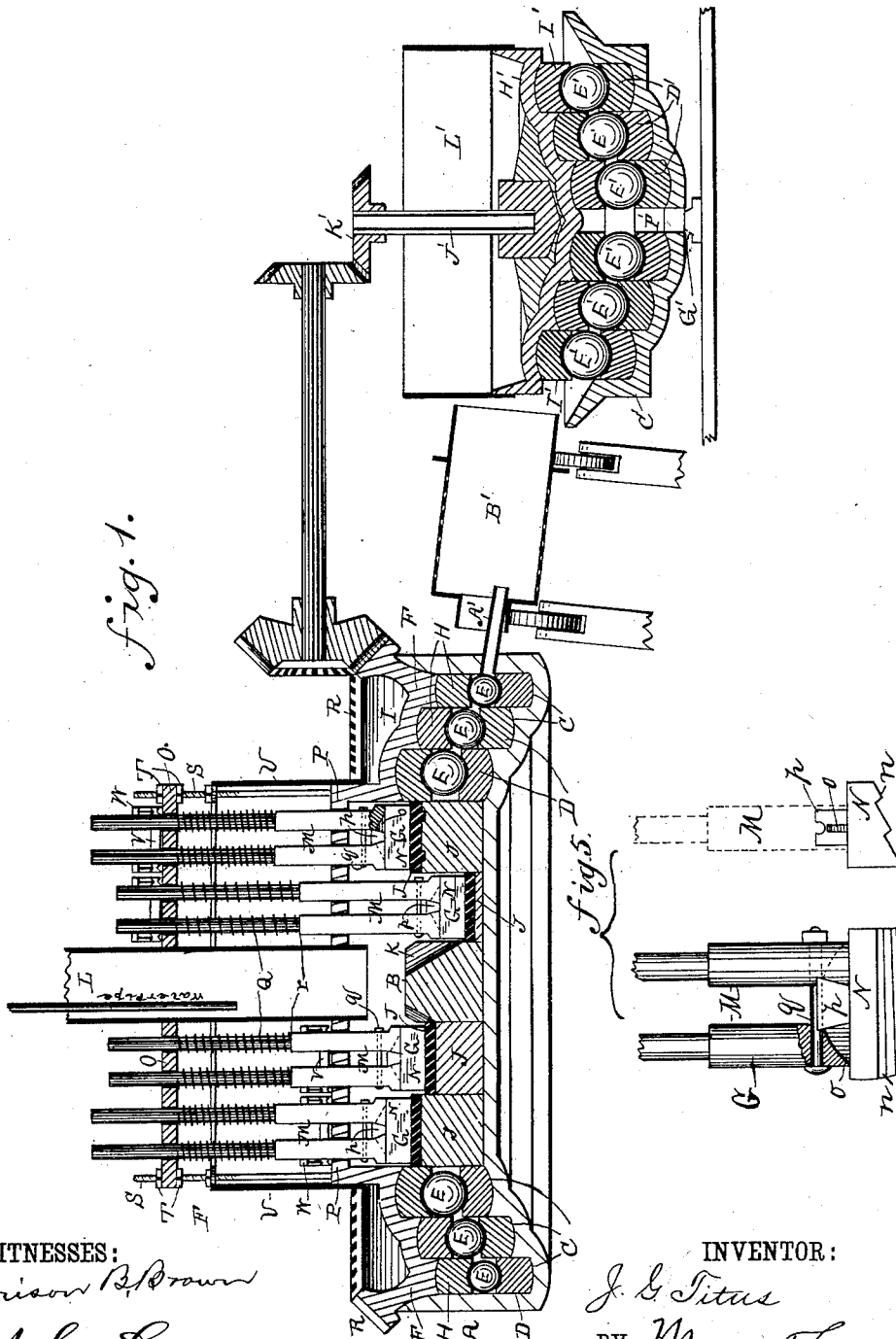
2 Sheets—Sheet 1.

J. G. TITUS.

QUARTZ MILL.

No. 320,415.

Patented June 16, 1885.



WITNESSES:
Harrison B. Brown
A. G. Lyne

INVENTOR:
J. G. Titus
BY *Munn & Co*
ATTORNEYS

(No Model.)

2 Sheets—Sheet 2.

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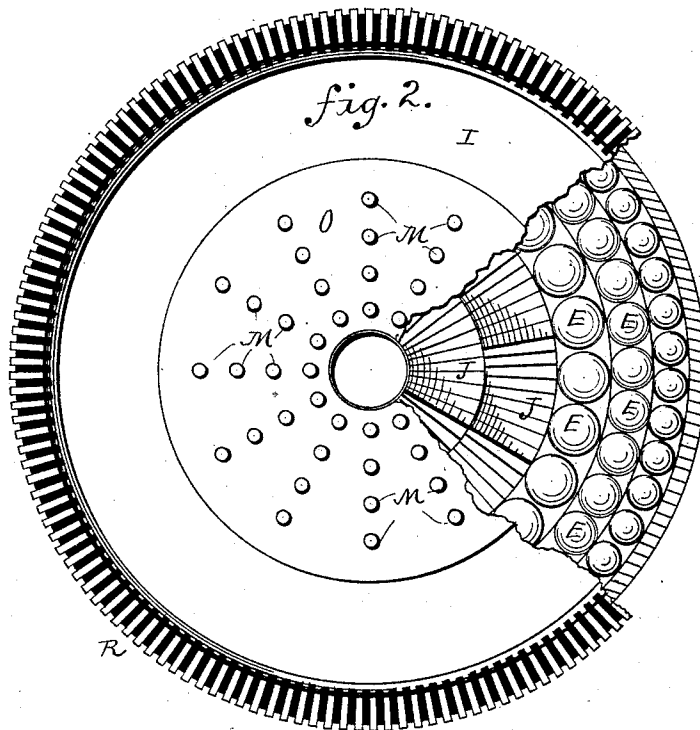


fig. 3.

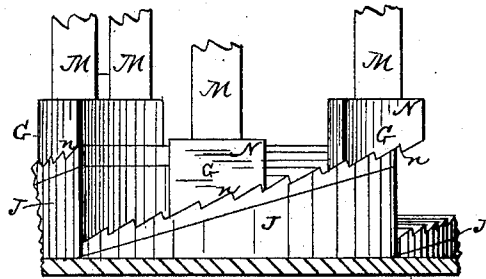
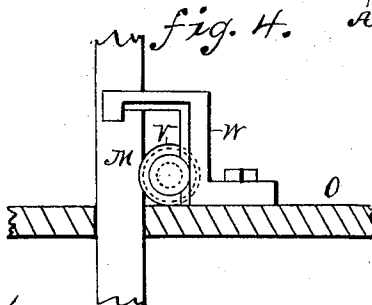


fig. 4.



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UNITED STATES PATENT OFFICE.

JACOB GRIGG TITUS, OF ELIZABETHTOWN, TERRITORY OF NEW MEXICO.

QUARTZ-MILL.

SPECIFICATION forming part of Letters Patent No. 320,415, dated June 16, 1885.

Application filed July 15, 1884. (No model.)

To all whom it may concern :

Be it known that I, JACOB G. TITUS, of Elizabethtown, in the county of Colfax and Territory of New Mexico, have invented a new and useful Improvement in Quartz-Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to quartz-mills; and it consists in the peculiar construction and arrangement of parts, as hereinafter fully described, and pointed out in the claims.

In the drawings, Figure 1 is a longitudinal vertical section of my quartz mill, partly broken away. Fig. 2 is a partial plan view of the same, partly broken away; and Figs. 3, 4, and 5 are detail views.

A indicates a cast-iron tub having a cone, B, at its center, and three (more or less) concentric grooves, C, in its bottom, which are arranged alongside each other, near the wall of the tub, and on a downward incline, the outer groove being the lowest. In the grooves C are secured dies D, consisting of sectional chilled-iron troughs laid in circles for receiving the chilled cast-iron balls E. On the balls E is supported a revolving frame, F, carrying the stamps G. This frame is provided with grooves on its under side, in which are secured sectional troughs or dies H, like the dies D, between which dies H and D the balls E are confined by the weight of the frame F and stamps G, and also by dead-weights, which are to be placed on top the said frame, in the recess I, when required. Around the cone B are arranged serrated inclines, formed by chilled dies J, and the cone is provided with guide-grooves K, leading down between said dies, to conduct the stones which are fed in at the hopper L to the lowest part of the dies, where they will receive the full force of the fall of the stamps. Each stamp consists of two standards, M, having a chilled-iron die, N, dovetailed and bolted between their lower ends. The die N is provided with a serrated incline, *n*, corresponding to the die J, and with a rib, *o*, which is fitted in recesses in the ends of the standards M on opposite sides of the dovetail tenon *p*, and under and parallel with the bolt *q*. The standards M are loosely arranged in holes in the plates O P of the frame F, and are provided with spiral springs

Q, bearing against shoulders *r* on the standards and the upper plate, O. When the frame F is rotated by means of the toothed rim R, which projects over the rim of the tub to prevent grease from dripping therein, the stamps are moved up the inclines J, against the tension of their springs, and made to strike against the lower portion of one die as they slip off the upper portion of another. In order to regulate the tension of the springs, the upper plate, O, is supported on threaded rods S by means of nuts T on opposite sides of the plate, whereby the latter may be raised or lowered. U is a sheet-iron casing inclosing the standards, and V V are rollers arranged on opposite sides of the standards, but at the top and bottom, respectively, to prevent frictional wear in the holes in which the standards work. The rollers are concaved peripherally where they receive the contact of the standards, and are held in guides W, which allow them to have a slight vertical movement as they rotate. The stamps are to be so spaced that only one shall strike at a time.

With the above construction, as the broken stone or ore is fed in at the hopper, it will be still further broken by the blows of the stamps, and then ground against the serrated inclines and washed outward under and between the balls, by which it will be finely pulverized. The pulp and water are finally discharged through a pipe or trough, A', inserted in an orifice in one side of the tub. The diameters of the balls and their troughs are made to differ according to their circle, the balls of the inner circle or trough being larger than the others, and those of the middle circle larger than those of the outer circle, so that as the larger balls become worn down they may be used in the next smaller trough. As the pulp and water pass from the tub A they are discharged into a revolving screen, B', from the opposite end of which the coarser particles of sand or stone are discharged into a second tub, C'. This tub C' is likewise provided with three circles of dies or troughs, D', and balls E', but is without stamps, and has an orifice, F', at the center of its bottom, and a valve, G', for closing the same. The balls E' are covered by a rotary plate, H', carrying dies or troughs I', and having a central vertical standard, J', provided with a bevel gear-wheel,

K', by which the device may be rotated at a higher rate of speed than the frame F, above described. The upper surface of the plate H' is shaped into a receptacle, L', for receiving 5 dead-weights when required. The tub C' is to be used only when it is desirable to increase the capacity of the mill. Where such second tub is not used, the sand discharged from the end of the screen may be fed back into the 10 tub A.

Smaller mills may be made, when desired, by using only one circle of stamps and one of balls, or such like construction. The mill, being made up of detachable sections, may be 15 conveniently transported into mountainous regions, and by making the tub A also in sections, which can be bolted together water-proof, the entire machine may be carried piecemeal to almost inaccessible places.

20 The particular construction of the pulverizer herein shown and described forms no part of the present invention; but I reserve to myself the right to make a separate application therefor at some future time.

25 What I claim is—

1. A quartz-mill consisting of a tub having a circular groove or trough in its bottom, a series of balls placed in said trough, a rotary plate or cover having a corresponding circular 30 groove and adapted to rotate on and with the balls, a battery of stamps carried by said

cover and dies in the bottom of the tub for operating the stamps as the cover is revolved, substantially as shown and described.

2. The combination, with the tub A, provided 35 with the cone B, having guide-grooves K and the inclined dies J arranged around the cone, of the rotating frame F and the stamps G, carried by said frame, and each composed of two standards and a die secured to their lower 40 ends, substantially as herein shown and described.

3. The combination, with the tub A, provided with the central cone, B, having guide-grooves K and the inclined dies J arranged around 45 the cone, of the rotating frame F, provided with the apertured plates O P, the stamps G, the springs Q, surrounding the standards of the stamps, and the central hopper, L, projecting down through the frame over the cone, 50 substantially as herein shown and described.

4. The combination of the stamp-die having a dovetail tenon and rib, the two parallel standards having recesses in their lower ends 55 for said rib, and the bolt securing said standards together on opposite sides of said tenon, substantially as shown and described.

JACOB GRIGG TITUS.

Witnesses:

WM. HARRISON,
J. W. HARRISON.